

## **REMARKS**

This paper is being provided in response to the Final Office Action mailed January 24, 2003, for the above-referenced application. In this response, Applicant has cancelled claim 16 and amended claims 1, 13 and 15 in order to clarify that which Applicant considers to be the invention. Further, Applicant has submitted a revised Abstract as requested by the Examiner. Applicant respectfully submits that the amendments to the claims are all supported by the originally filed application.

The rejection of claims 1-3, 5-7, 9, 12-15, 17 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,389,046 to Stayt, Jr. et al. (hereinafter "Stayt") is hereby traversed and reconsideration thereof is respectfully requested in view of the amendments to the claims contained herein.

Applicant's independent claim 1, as amended herein, recites a wavelength stabilized laser module comprising a semiconductor laser, a temperature calibrating unit to calibrate a temperature of the laser, a converting unit to convert light emitted from said semiconductor laser to a single beam of parallel luminous flux, a first photoelectric converting unit to receive a first part of the beam and to convert it to an electric signal, a filter to receive a second part of the beam and to continuously change its transmittance depending on wavelengths of the beam, a second photoelectric converting unit to receive light transmitted through the filter and to convert it to an electric signal, wherein a control signal, to be used for stabilization, obtained by computations of the electric signals is fed back to the laser and/or the temperature calibrating unit so that the laser is able to stably

emit laser light having a reference wavelength to be used as a target for stabilization of wavelengths. Further, the first and second photoelectric converting units are placed in parallel on a holding substrate and are both positioned in a tilt manner relative to an optical axis of incident light. Claims 2 through 12, 14, 15, 17, 18, and 19 depend from claim 1.

Applicant's independent claim 13, as amended herein, recites a wavelength stabilized laser module comprising a semiconductor laser, a temperature calibrating unit to calibrate a temperature of the laser, a converting unit to convert light emitted from said semiconductor laser to a single beam of parallel luminous flux, a first photoelectric converting unit to receive a first part of the beam and to convert it to an electric signal, a filter to receive a second part of the beam and to continuously change its transmittance depending on wavelengths of the beam, a second photoelectric converting unit to receive light transmitted through the filter and to convert it to an electric signal, wherein a control signal, to be used for stabilization, obtained by computations of the electric signals is fed back to the laser and/or the temperature calibrating unit so that the laser is able to stably emit laser light having a reference wavelength to be used as a target for stabilization of wavelengths. Further, the filter is fixed to the second photoelectric converting unit.

The Stayt reference discloses methods using a dedicated control laser element 150 in an array 110 of semiconductor lasers for sensing and stabilizing the laser array power and wavelength and reducing drift in a wavelength stabilized laser source (Column 1, lines 12-15). The system described therein includes a discriminator 301, which may be

an interferometer or a high-pass, low-pass, band-pass or interference filter, which generates a pair of optical beams of equal wavelength (Column 7, lines 16-20) from the output of the control laser element 150. Each one of a pair of photodetectors 441 detects one of the two emergent optical beams from the discriminator 301 and generates an electrical signal 451, 551 (Column 7, lines 27-29). The electrical output signals are amplified and then input into a closed feedback loop 700, which evaluates differences in the electrical signals and produces a control signal 720. The control signal 720 is communicated to a temperature controller that adjusts the control laser element 150 (and, thus the array 110) to produce output 160 at the desired wavelength (Column 6, lines 20-34).

As amended herein, Applicant's claim 1 now recites the feature that the first and second photoelectric converting units are placed in parallel on a holding substrate and are *both* positioned in a tilt manner relative to an optical axis of incident light. The Office Action deals with tilting of a photoelectric converting unit in a 35 U.S.C. 103 rejection over Stayt in view of Chang-Hasnain with respect to now-cancelled claim 16. As explained below, Applicant respectfully submits that neither Stayt nor Chang-Hasnain teach or suggest that the first and second photoelectric converting units are placed in parallel on a holding substrate and are *both* positioned in a tilt manner relative to an optical axis of incident light.

As amended herein, claim 13 has been rewritten into independent form. Independent claim 13 recites the feature that the filter is *fixed* to the second photoelectric

converting unit. The Office Action states that Stayt discloses in Figure 4 that filter 331 is fixed to the second photoelectric converting unit 441; however, Stayt's Figure 4 shows only that an output of the filter is sent to the photoelectric converting unit 441, as illustrated by an arrow drawn from element 331 to element 441. Applicant respectfully submits that Stayt does not teach or suggest that the filter is fixed to the second photoelectric unit as is recited by Applicant.

Accordingly, based on the above, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 4 under 35 U.S.C. 103(a) as being unpatentable over Stayt is hereby traversed and reconsideration is respectfully requested.

The features of independent claim 1 are discussed above. Claim 4 depends from claim 1.

Applicant respectfully submits that Stayt does not teach or suggest that the first and second photoelectric converting units are placed in parallel on a holding substrate and are *both* positioned in a tilt manner relative to an optical axis of incident light. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 8 under 35 U.S.C. 103(a) as being unpatentable over Stayt in view of U.S. Patent No. 6,018,536 to Alphonse (hereinafter "Alphonse") is hereby traversed and reconsideration is respectfully requested.

The features of independent claim 1 are discussed above. Claim 8 depends from claim 1.

The Alphonse reference discloses a laser that produces light having multiple wavelengths. The laser includes a gain medium disposed within the laser resonance cavity, a dispersion element coupled to the gain medium and within the laser resonance cavity, and a wavelengths-selective element having non-abutting reflective segments.

Applicant respectfully submits that Alphonse fails to overcome the deficiencies of Stayt with respect to Applicant's claim 1. Specifically, Applicant respectfully submits that neither Stayt nor Alphonse teach or suggest that the first and second photoelectric converting units are placed in parallel on a holding substrate and are *both* positioned in a tilt manner relative to an optical axis of incident light. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 10 under 35 U.S.C. 103(a) as being unpatentable over Stayt in view of Alphonse is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of independent claim 1 are discussed above. Claim 10 depends from claim 1.

Applicant respectfully submits that Alphonse fails to overcome the deficiencies of Stayt with respect to claim 1. Specifically, Applicant respectfully submits that neither Stayt nor Alphonse teach or suggest that the first and second photoelectric converting units are placed in parallel on a holding substrate and are *both* positioned in a tilt manner relative to an optical axis of incident light. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 16 under 35 U.S.C. 103(a) as being unpatentable over Stayt in view of U.S. Patent No. 6,233,263 to Chang-Hasnain et al. (hereinafter "Chang-Hasnain") is hereby traversed and reconsideration is respectfully requested.

Chang-Hasnain discloses a monitoring and control assembly for an optical system that includes a tunable laser. The laser is disclosed as generating a divergent output beam along an optical axis.

Claim 16 has been cancelled; however, its subject matter has been incorporated into independent claim 1 with additional modifications. Independent claim 1 now recites that feature that the first and second photoelectric converting units are placed in parallel on a holding substrate and are *both* positioned in a tilt manner relative to an optical axis of incident light. Chang-Hasnain shows in Figure 1 a single photodiode positioned at an

angle with respect to an incident laser beam. Further, Chang-Hasnain discloses the adjusting of the angle of a filter rather than adjustment of the tilt of the photodiode in order to provide angular dependence of wavelength reflection. Applicant respectfully submits that neither Stayt nor Chang-Hasnain teach or suggest that the first and second photoelectric converting units are placed in parallel on a holding substrate and are both positioned in a tilt manner relative to an optical axis of incident light as is claimed by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn as applied to independent claim 1.

The rejection of claims 18 and 19 under 35 U.S.C. 103(a) as being unpatentable over Stayt in view of U.S. Patent No. 5,446,750 to Ohtsuka et al. (hereinafter "Ohtsuka") is hereby traversed and reconsideration is respectfully requested.

The features of independent claim 1 are discussed above. Claims 18 and 19 depend from claim 1.

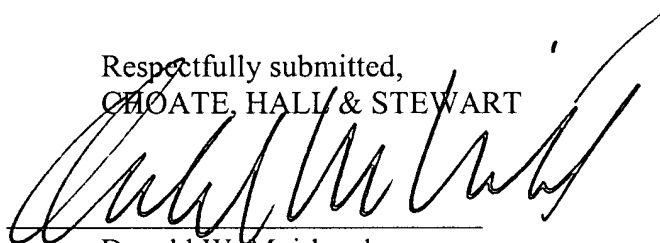
The Ohtsuka reference discloses a laser diode pumped solid laser having an optical module with a laser diode, a solid laser crystal, which is excited by a beam generated by the laser diode, and a resonator. An electronic cooling device has a cooling surface, on which the optical module is placed, and a heat radiating surface.

Applicant respectfully submits that Ohtsuka fails to overcome the above-noted deficiencies of Stayt with respect to claim 1. Specifically, Applicant respectfully submits

that neither Stayt nor Ohtsuka teach or suggest that the first and second photoelectric converting units are placed in parallel on a holding substrate and are both positioned in a tilt manner relative to an optical axis of incident light as is claimed by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4038.

Respectfully submitted,  
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